Wis Doc
Nat.
3:
R 4/
32
c. 8

Dept. of Natural Resources
Technical Library
3911 Fish Hatchery Road
Fitchburg, WI 53711-5397

#8

Research Report No. 32

ESTABLISHING OPENINGS PROGRAMS

ON LOAMY SOILS IN NORTHERN WISCONSIN

Dept. of Natural Resources
Technical Library
3911 Fish Hatchery Road
Fitchburg, WI 53711 - 5397

LOAN COPY

By

Keith R. McCaffery

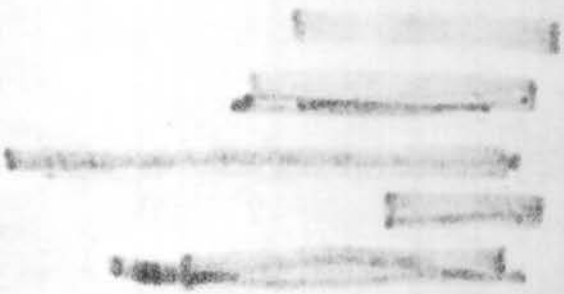
DEPARTMENT OF NATURAL RESOURCES

Division of Conservation

Bureau of Research and Planning

May, 1968

385-21



(Supported in part by funds from the Federal Aid in Wildlife Restoration Act under Pittman-Robertson project W-141-R.)

CONTENTS

Wildlife use. Deer use openings most intensively in spring and fall. Ruffed grouse frequent the edges, particularly where brushy escape cover and fruit producing shrubs are present. Black bears are common visitors to openings, where they find green forage, fruits, and insects.

BACKGROUND

Why

Forest openings as discussed in this report refer to forest stands containing less than 10 percent stocking of trees or upland brush. Typically these openings contain a variety of grasses and weeds, with bluegrass (*Poa pratensis*) and quack-grass (*Agropyron repens*) most important (Levy, 1965).

Most wildlife ecologists agree that openings and interspersion of cover types favor many species of forest wildlife. Recent research has refined our understanding of the particular importance of openings to deer in northern Wisconsin.

We have found that extensive areas of northern hardwoods essentially devoid of openings contain few deer in summer, usually less than 10 deer per square mile, while similar hardwood areas with openings were found to have almost twice as much deer activity. Low densities of deer in hardwood forest types without openings have been attributed to low abundance of food (DeGarmo and Gill, 1958). We agree and believe openings contribute to available food and thus influence summer distribution of deer. Openings are used three to five times as intensively during spring and fall as would be expected if deer were randomly distributed over the range (McCaffery and Creed, 1966; McCaffery, Creed and Thompson, 1967). These are periods of the year when deer are also seeking green forage in agricultural fields and along roadsides.

These conclusions may seem unimportant in these years with high numbers of deer harvested from a similarly high statewide deer population. However, local areas in the north are showing the effect of insidious ecological changes. More and more of what was aspen, brush, or hardwood slashings 25 years ago is succeeding to pole-sized and larger northern hardwoods. The increasing effect of this change on game will be greatly magnified as small areas, formerly sodded but now planted to conifers, grow up.

Particularly alarming is the fact that sodded openings such as were originally created by logging camps and homesteads are no longer being created through modern timber harvest techniques. Once existing openings disappear, they are gone! Perhaps they can be recreated through special treatments, but certainly not as economically as existing openings can be maintained.

Another factor that should not be overlooked involves non-wildlife

values of openings, which relate to the importance of openings to people. Openings contribute to our overall environmental quality. They provide color, variety, and wildflowers for sightseers, and an opportunity to view wildlife. They give hikers natural and historic sites to explore. Berry pickers utilize wild fruits that are abundant in many openings. And hunters take advantage of openings for finding and shooting game.

There may be many other more subtle ecological values not yet recognized. Openings are historically an integral component of the forest community. Curtis (1959) warned against destroying openings until the effect on the "total biota" can be assessed. More thought should be given openings in addition to the concern for preserving them merely as a valuable segment of game range.

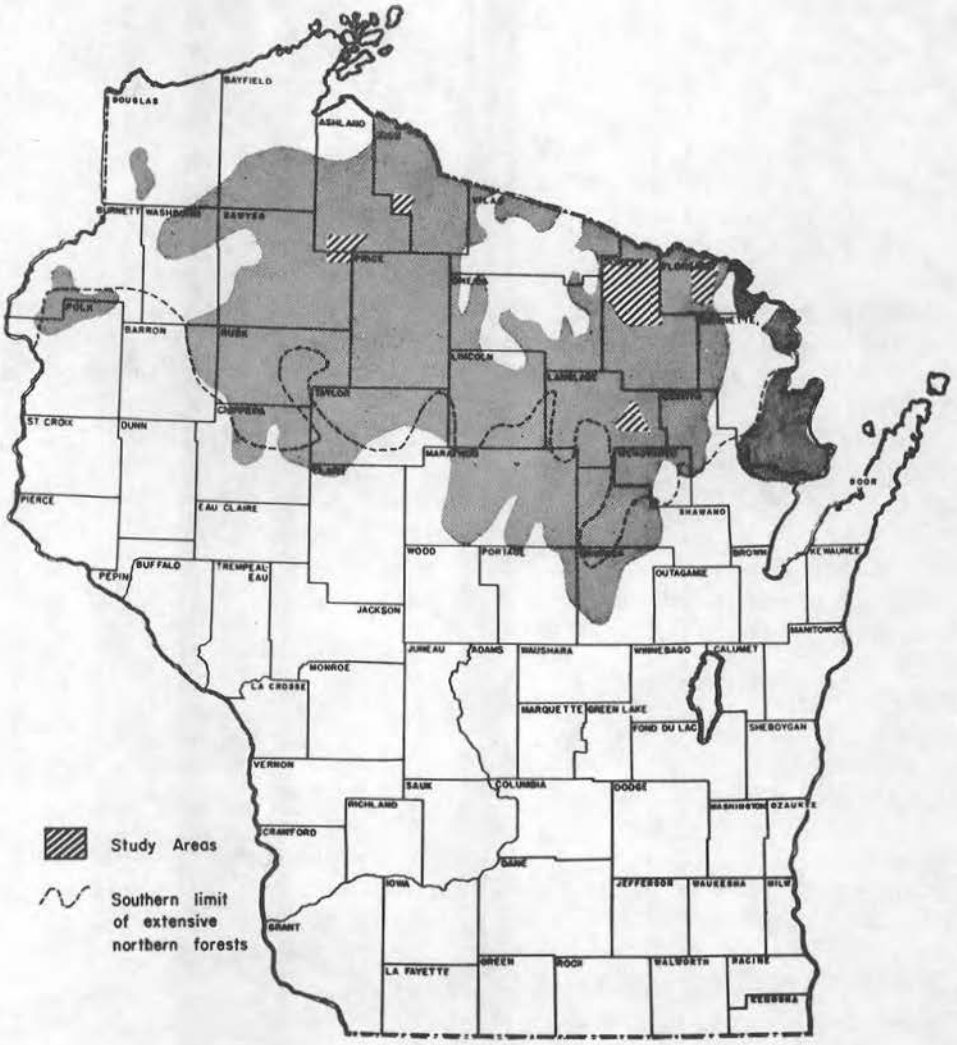
Where

A special effort to save openings is not required throughout all of northern Wisconsin. At this point in our understanding, only on the heavier soils can we demonstrate a distinct requirement. Studies are continuing in forests on very sandy soils. Forested areas on sands contain many small openings, and usually the floral composition in these openings is not markedly different from vegetation found within the adjacent forest stands. This is in contrast to openings on heavier soils where introduced grasses constitute a significant portion of the floral composition (Levy, 1965).

Our recommendations presently apply to the general area shown in Figure 1. Precise opening requirements for specific locales within this area vary considerably and must be determined by the local resource manager. Prime factors to be considered in determining the requirements for openings and the justification for a program are: (1) distribution of farm clearings; (2) present and future forest types and timber harvest prospects; and (3) potential for adequately harvesting surplus deer.

Most large unbroken forested tracts are either public or industrial forests. Small private holdings are usually well interspersed with clearings or active farms. The requirement for deer openings on private forests is therefore minimal. But, the resource manager should not overlook the other values of preserving openings if public land is located adjacent to farm lands.

That most unbroken tracts are in public ownership is advantageous. Here programs may be implemented with the greatest freedom. Important is the immediate identification of those state and county forests where maintenance programs for openings are needed. Only by implementing programs on these lands can an example be set for other forest owners. Without action programs on state and county lands, it is unreasonable to criticize inaction on other forest properties.



Heavy soil and northern hardwood region. (Adapted from Wilde, et al., 1949 and Stone and Thorne, 1961).

How Much

What portion of the forest landscape should be maintained in openings? Most authorities recommend percentages ranging from 5 to 12 percent for optimum forest game range (Allison, 1966; Giles, 1961; Leopold, 1933; and Shaw, 1967). The 12 percent value is impractical for areas devoted primarily for timber production, and I do not believe this much is necessary or justified in extensive game management programs. For the most part, there are few public forests on heavy soils which presently contain more than 5 percent open ground; hence, it becomes academic to talk of preserving more.

The precise openings requirement is a function of forest composition, intensity of forest management, and the deer density desired. Our studies have shown that scattered openings comprising 10 percent is ample grassland in a 400-acre red pine plantation (McCaffery, 1967), but that 1 percent is inadequate in hardwood country (McCaffery, 1966). One study area of township size was found to have a substantial deer population (20-25 deer per square mile) with only 2 percent in wild openings. However, this small proportion in wild openings was supplemented by an additional 4.2 percent in farm fields on one side of the township. For a rule-of-thumb, we believe 5 percent will be adequate for most areas. If openings are very well distributed relative to the productive summer range forest types (aspen, oak, pine, upland brush), 3 percent may be sufficient.

Opening size is also an important consideration. From the biological standpoint, openings need not be especially large to fulfill the requirements of deer. Our research has indicated that openings of $\frac{1}{2}$ to 5 acres receive the highest intensity of use. However, larger openings will require less frequent maintenance, and have the highest "people value". Therefore, if some larger openings are available for non-forestry users, they should be incorporated into the plan.

How Maintain

At the present time we are not recommending extensive creation of openings.

We are recommending strongly that existing wildlife openings be meaningfully designated for management. Once they are identified as wildlife openings, whether or not a maintenance program is initiated immediately, their existence is at least assured for many years (McCaffery, 1967 and Smith, 1942).

Extensive creation of openings is too costly to be justified in relation to the present supply and demand for deer. Furthermore, such clearings can be made at any time. On the other hand, MAINTENANCE CAN ONLY BE DONE WHILE THERE ARE NATURAL OPENINGS REMAINING TO MAINTAIN.

PROCEDURES

The following procedures were developed while planning an openings program for a portion of the Langlade County Forest. Actual implementation of the management program has been delayed. Hence, many of the latter steps listed here have not been applied. Therefore I anticipate that there will be changes and shortcuts discovered through use. I would appreciate receiving any recommendations for streamlining these procedures that you may discover while working with them.

"Frost pocket" surrounded by northern hardwoods. Maintenance requirements in this type of opening are minimal. Esthetic values are often high, and deer use is generally comparable to other openings without major topographic influence.

Camp opening. Most openings on loamy soils have resulted from some form of prolonged human and animal disturbance, such as logging camps, railroad landings, or homesteads. Similar openings are not being created by present land uses.

I. INVENTORY

A. Materials

1. Recent forest-cover-type township maps

2. Recent aerial photography and index

3. Stereoscope

4. Acetates (6" x 6")

5. No. 0 Rapidograph pen or No. 3 pencil

6. Color coding pencils: red, blue, green and yellow

7. County highway maps

B. Procedures

1. Outline ownership to be worked on county highway map. Prepare to work one township or unit at a time.

2. Using index, select flight folder containing photos of outer sections of township or unit.

3. Center acetate on desired section. Most forest management photos have section corners marked; if not, use physical features on type map for reference.

4. Basic information required on each acetate includes the following (See Appendix A):

   a) Section, Township and Range
   b) Section corners
   c) Access in red
   d) Water in blue
   e) Agricultural fields in yellow, if desired

5. Using stereoscope, delineate all forest openings larger than $\frac{1}{2}$ acre noting where maintenance is necessary: i.e., "20% UB," "10% Trees," etc.

6. Check type map for openings not on your acetate and recheck photo.

7. Color section on highway map to indicate it has been completed, thereby preventing omission of sections or duplication of effort.

8. Proceed with consecutive sections in the flight (up, down, or across). Following sections in numerical order will result in unnecessary shuffling of flight folders.

C. Selection

1. Check acetate tracings with type map for errors such as muskeg and open marshes.

2. Trace private ownership boundaries from type map onto acetate in green.

3. Color coding (See Appendix A):

   a) Color green all old camps, log landings, and other openings known to be well sodded and/or without major maintenance requirements, and to which there is easy access.
   b) Crosshatch with green other openings with easy access where immediate maintenance (within 5 years) is needed.
   c) Color red other inaccessible openings that have potential including forest openings on private land.
   d) Openings remaining uncolored because of unfamiliarity should be reconnoitered. Consultation with other resource workers who are familiar with the area will minimize field effort.

4. Carefully eliminate unneeded openings. More than 5 percent in an intensively managed forest may be considered excessive. Consider:

   a) Other uses (forestry)
   b) Ease of maintenance (access and stability)
   c) Esthetics (especially important along roads)
   d) Ecological position (nearness to other components of range)
   e) Vegetative quality (Junegrass and quack-grass vs. bracken and hawkweed)
   f) Size (maintenance vs. distribution)

5. Check acreage and distribution. If acreage is lacking or distribution poor, try to supplement through ground reconnaissance and salvaging "1948 openings" (openings that appear on the 1948 type maps but not on the 1963 photos). Intimate knowledge of an area plus ground reconnaissance will often double the number of openings as seen on air photos.

6. If a major effort (approaching creation) is needed to supply necessary openings, select areas formerly open or areas with Junegrass or quack-grass present as major components of the

ground flora. These areas are usually associated with rock elm, cherry, balsam, etc.

II. RECORDS

A. Map

1. Using a 30" x 30" sheet of vellum and the township type map, trace section corners, compartment boundaries and access onto vellum.

2. Slide acetate tracing from photo between vellum and map, positioning acetate using known landmarks (water, access, section corners, etc.) and transfer openings for management and property boundaries to vellum.

3. Color code openings on vellum as under I.C.3.

4. Grid count openings by color code and ownership (if private land contains important openings) on form as shown in Appendix B. Make pencil entries in the event of future changes.

5. Incorporate completed map in District Forester's county forest map book in front of his planting and cultural treatment map for the township.

B. Compartment Examination Records

1. On line 1, assign a separate stand number or sub-lettered number to wildlife openings, such as, 7 for grass and 7A for wildlife openings.

2. On line 2, indicate usual type symbol "G" or "WO".

3. On line 3, enter number of openings and acreage from Tally Form (Appendix B) as shown in Appendix C.

4. On line 19, code "8", "Potential for other", with remark "Maintain as wildlife openings".

5. Other lines may be completed as desired.

6. For future reconnaissance purposes, compartment file maps should also show wildlife openings.

C. Comprehensive County Forest Land Use Plan

After all townships or units to be programed in a county are

completed, publish Appendix B with explanatory narrative. Narrative should be prepared jointly with District Forester. Distribute Appendix B and explanation for inclusion with land use plans.

III. RECONNAISSANCE

A. Regular reconnaissance will be achieved during compartment examinations.

B. Supplementary reconnaissance can be done incidentally to other field work.

IV. MAINTENANCE

A. Methods

1. No aspen cutting should be permitted within 1 chain of an opening edge unless special treatment is to follow, such as herbicides or mechanical control in the opening.

2. Sod disturbance in openings should be minimized to discourage pioneering woody plants.

3. Shade trees should be removed from openings to permit direct sunlight, except where esthetics will be damaged.

4. Paint stumps of cut trees with herbicide to reduce sprouting.

5. Use basal spray of 2,4-D and 2,4,5-T on aspen suckers in late May.

6. Brush (hazel, willow and tree sprouts) may be encouraged around openings to promote ruffed grouse use, but should be done by manipulating the woods edge in small openings, not the opening itself. Disturbance within openings reduces natural resistance to succession, and results in costly maintenance.

7. To minimize cost, treat several openings in an area at a time.

B. Records

1. As access is gained to formerly inaccessible openings, color code on map should be changed from red to green or green crosshatch if maintenance is needed.

2. Green crosshatched openings (those requiring maintenance work) should be colored all green after maintenance work is completed and opening is stabilized.

Aspen opening. Maintenance considerations are paramount in aspen types. Invasion by suckers is normally deterred by frost, grass, and deer browsing. A 1-chain buffer zone around openings will prevent greatly accelerated suckering when aspen is cut.

LITERATURE CITED

ALLISON, D. G.
1966. Improving your land for ruffed grouse. N.H. Fish & Game Dept. Concord, N.H. 17 p.

CURTIS, J. T.
1959. The vegetation of Wisconsin/ An ordination of plant communities. University of Wisconsin Press, Madison. xii + 87 p.

DEGARMO, W. R. and JOHN GILL
1958. West Virginia white-tails. Conservation Commission of W. Va. Bull. No. 4. viii + 87 p.

GILES, R. H., JR.
1961. Overlay mapping as a technique for improved management of upland game. Ohio Coop. Wildl. Unit. Release No. 212. 6 p.

LEOPOLD, ALDO
1933. Game management. Charles Scribners & Sons, New York and London. xii + 481 p.

LEVY, G. F.
1965. The phytosociology of northern Wisconsin upland openings. Ph. D. Thesis. University of Wis. Madison. 95 p.

MCCAFFERY, K. R.
1966. Relation of forest cover types and openings to deer populations. Wis. Conservation Dept. Job IV-A. Job Compl. Rpt. for Pittman-Robertson Proj. W-141-R-1. Mimeo, 15 p.

1967. Relation of forest cover types and openings to deer populations. Wis. Conservation Dept. Job IV-A. Job Compl. Rpt. for Pittman-Robertson Proj. W-141-R-2. Mimeo, 15 p.

MCCAFFERY, K. R. and W. A. CREED
1966. Progress in forest openings research. Wis. Conservation Dept. Research Report No. 16. Mimeo, 9 p.

MCCAFFERY, K. R., W. A. CREED and D. R. THOMPSON
1967. Measuring deer use of forest openings. Presented at 29th Midwest Fish & Wildl. Conf., Madison, Wis. Mimeo, 7 p.

SHAW, S. P.
1967. Private woodlands in the Northeast--Are we neglecting their wildlife potential? Le Naturaliste Canadien 94:347-357.

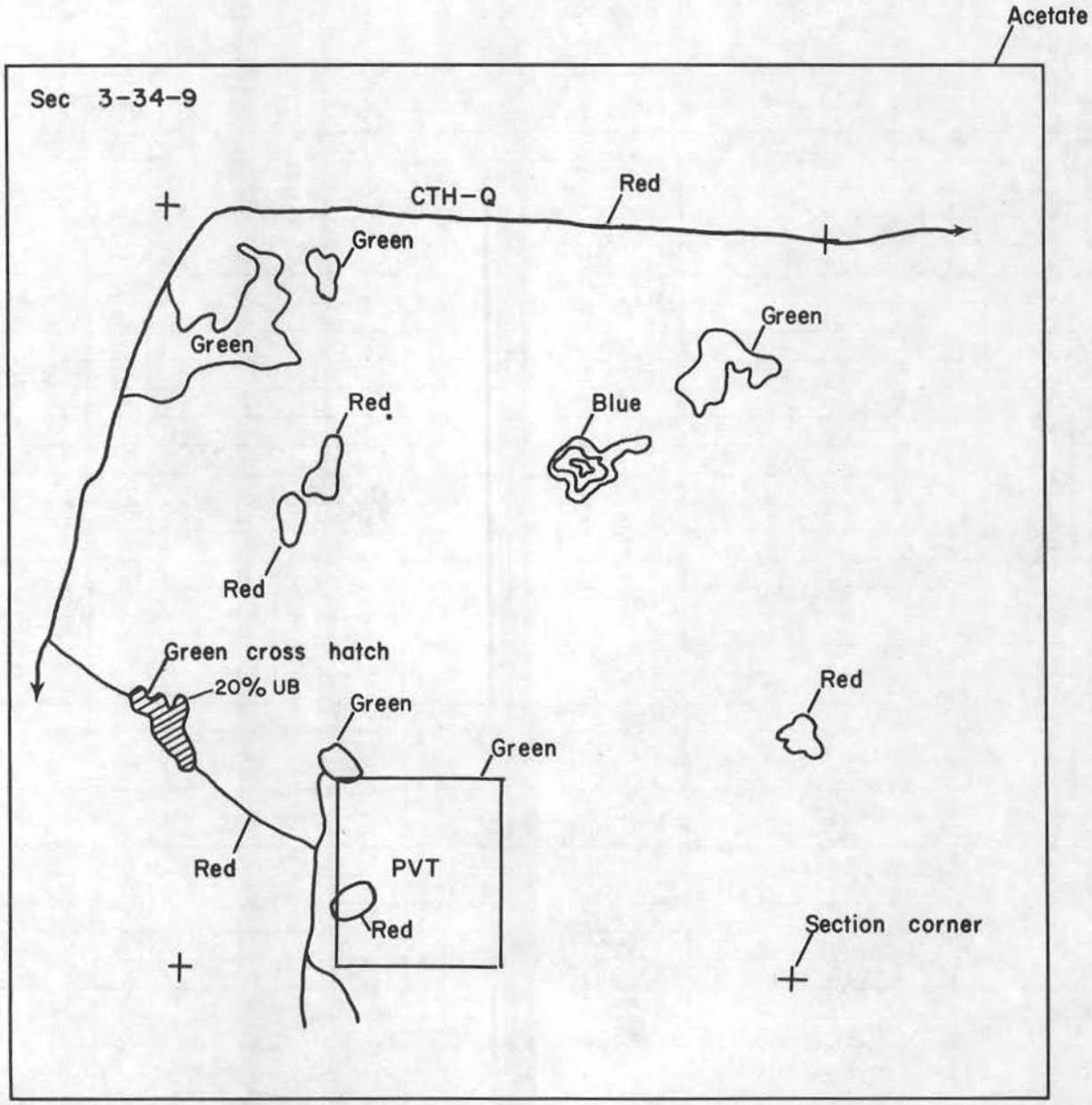
SMITH, N. F.
1942. Forest openings: Shall we help or hinder their closing? Michigan Conservation 11(6):4-5,11.

STONE, R. N. and H. W. THORNE
1961. Wisconsin's forest resources. U.S. Forest Serv., Lake States Forest Expt. Sta. Station Paper 90. 52 p.

WILDE, S. A., F. G. WILSON and D. P. WHITE
1949. Soils in Wisconsin in relation to silviculture. Wis. Conservation Dept. Publ. No. 525-49. 171 p.

APPENDIX A

EXAMPLE OF ACETATE TRACING FROM AERIAL PHOTO WITH COLOR CODING AND NECESSARY IDENTIFICATION



APPENDIX B
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Division of Conservation
Box 450
Madison, Wisconsin 53701

Fi-278

PARRISH TOWNSHIP (34-9E) OPENINGS

ompartment	Semi-Permanent		Need Maint.		Inaccessible		TOTAL		Other Private	
	Number	Acreage	Number	Acreage	Number	Acreage	Number	Acreage	Number	Acres

REV. 10-67

APPENDIX C

Wisconsin Conservation Department
Madison 1, Wisconsin

F-229

COMPARTMENT EXAMINATION RECORD

ONEIDA (County or Forest) Comp. Acreage 405

Comp. No. 86 Sec. ____ T 36 R 4 Date 6-22-60 By ____

1. Stand No.	1	2	3	4	5	6
2. Timber Type	LB	A0-5"	A0-5"	A5-11"	G	WO
3. Acres	10	45	25	5	15	3/5
4. Year of Origin	32	29	31	32		
5. Total Height	51	38	46	56		
6. Average DBH & Main Range Diameters	8"6-10	5"4-6	5"4-7	6"4-8		
7. Growth	9	10	9	9		
8. Site Index	65	55	60	70		
9. Stocking	35-40	35-40	40-45	45-50		
10. Volume Cords	2-3 cd	1 cd	2 cd	4-5 cd		
" Bd. Ft.						
11. Mgt. Objective						
12. Mgt. Prescription						
13. TST Needs						
14. Regeneration Conditions						
15. Plantation Needs						
16. Site Preparation						
17. Logging Chance						
18. Operability						
19. Recreational Potential						8
20. Soil						
21. Year of Harvest	1960-65	1960-65	RE-EX 1965	1960-65		RE-EX 1970
22. Year of Treatment						
23. Remarks	A5-11" Hyp. Hyp. many dead and dying	A5-11" stand u. poor Hyp.	A5-11" cut as possible	Rot in bored trees, Hyp.	Some T, H coming in s.w. Hyp. sod cover. Furrow and plant s.w. 2-1 or 3-0	Heavy sod. Release scattered Elm. Maintain as wildlife opening.

2-63